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Managerial Control

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THERE are in Canada a large number of industrial, commercial, and retail businesses that are not earning adequate profits. A portion of these—particularly those in certain capital goods and construction industries are in this condition because there is no market, or a very limited market, for their services, and there is very little they can do to create a market. For the great majority of the remainder, however, there is a market of some kind; perhaps not so large as in the pre-depression period, but still one of adequate proportions for the earning of profits if properly managed. It is with these that this paper is concerned.

The earning of profits is a function of management. In times of rising or high prices and of high purchasing power, it is relatively easy to show a profit and loss statement that makes good reading for the shareholders and creditors, but in times of crisis, as in these present times, the difficulties are so great that only the highest order of management succeeds in showing any profits at all.

That the quality of management is the basic factor in determining success or failure is well illustrated by the following three actual cases:—

Three Illustrations

Industry A had not been able to do better than pay its bond interest and set up reasonable reserves since its formation in 1919. Early in 1930, when the effects of depression were beginning to be felt, the management was changed and the managerial technique completely revised. In November 1930 the company was able to pay a dividend of 25 cents per share, and to continue the payment of regular quarterly dividends at this rate until February 1933. On this date the president announced the payment of an extra dividend of 25 cents per share and further announced that in the previous month the company had, out of cash in hand, retired its outstanding bond issue in its entirety.

Industry B was very near bankruptcy when its managerial technique was changed early in 1931. At the end of that year its trading profit was about \$2,000.00, in 1932 it was \$52,000.00; and in 1933 it was nearly \$150,000.00.

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Industry C did not earn adequate profits even in the good years, though it paid some dividends. When depression threatened complete extinction its management was changed, even though a heavy cost was incurred by so doing. Within a year the technique of the new management had so increased earnings as to cover all charges and carry a substantial sum to surplus. At the end of the second year it was found possible to resume the payment of dividends out of earnings.

These are but three examples, selected from a longer list, of businesses putting themselves on a solid footing through improved managerial technique. Prior to the change, their management was not greatly worse than that of the average; nor can their ultimate success be attributed to specially favourable circumstances for each of them was in a highly competitive field and each found its market lower in consumptive power than in pre-depression times.

If it could be done in these three instances, surely it could be done in many others. There is good reason to believe that it could be done in any business that has justification at all for its existence. It behooves us, then, to examine into the managerial techniques responsible for these successes, to see where they differ from those employed by the common run of management, and to see how they can be successfully employed in the raising of the status of presently weak enterprises.

The Engineer's Function

At this point the engineer comes into the picture. It is to him that we owe much of our present civilization. His railroads, steamships, automobiles, and aircraft have solved the problems of transport and so overcome the handicaps of distance; with the telegraph, the telephone, and the radio he has made quick communication with the whole world a commonplace matter; his water works and sewage disposal works have added greatly to our comfort and security in health; his development of power has made our factory system possible, and his development of productive machinery has immeasurably increased our capacity to produce in quantity and at relatively low cost.

Not the least of the engineer's achievements has been his development of a new technique in industrial management. Just over fifty years ago Frederick W. Taylor was promoted from machinist to foreman in a steel mill and began to ask his famous question, "What IS a full day's work for a workman?" When he got a different answer every time he asked the question he realised that management hitherto had been based on intuitive judgment rather than on scientifically determined FACT, and that much of the intuitive judgment was probable false, or mistaken. Management—supposedly buying the production of labour—did not KNOW, and had not developed a means of

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determining accurately, how much production it should get for its labour dollar. The rest is history. Taylor set out to develop a technique of management such that all its judgments could be based on accurately determined facts rather than on rule-of-thumb or intuitive concepts, and, eventually, he gave to the world a technique which has made possible most of our present day large scale production. This engineering technique, improved and developed as it has been by Taylor's many successors, has yet been slow of acceptance and adoption by industry as a whole. It is, however, a technique best adapted to the needs of the age in which we live, and sheer pressure of economic circumstance is slowly forcing its adoption by business in its desire to survive the intensified competition of tomorrow.

Control

The outstanding characteristic of the engineering technique is its ability to secure a definite control over every phase and activity of the business. This is in sharp contrast with the relatively loose control characteristic of most businesses. It is common to see a business strong in its productive end but weak in its sales end; another that is strong in both sales and production but weak in its financing; still another that is relatively weak in all divisions. Careful analysis of these cases will invariably indicate that there is a lack of positive control in the weak divisions, and that this indefiniteness of control is responsible for a substantial loss of profits.

The engineering technique provides adequate control by setting up accurately determined standards against which management can measure the effectiveness of every activity in which the business is engaged. These standards are so arranged that every activity is directly related to the earning of profit, and so that any loss or weakness in any division immediately becomes apparent to the management and quickly enough that the weakness can be corrected before substantial loss of profits occurs.

The setting up of such standards of measurement is peculiarly an engineering sales function inasmuch that the only standards that will function successfully are those set up on a basis of accurate FACT, and the trained engineering mind is the type best adapted to carry on the research, and place the proper weight on the variables, necessary in the setting up of these control standards. Standards based on rule-of-thumb guesswork, on acquired trade ideas, or on sheer intuition always fail in their purpose. It is, perhaps, for this reason that few businesses have adequate control over sales activities. The typical sales executive is a man who largely bases his judgments on intuitive and acquired ideas. He has neither the temperament nor the disciplined analytical ability necessary for the patient research required in the securing of the FACTS on which control must be based. Consequently he is prone to think that scientific control of the sales function is an impossibility. Actually it is no more difficult

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to secure than is control of the productive function, and it is well known that the latter is now subject to the most accurate control, with greatly increased profits as a result.

Sales Control

Most business executives are today giving thought to the problem of increasing sales. A few—the most enlightened—are also considering how best they can reduce the cost of selling, realising that a dollar saved, is on the average, the profit on a ten dollar sale. The engineering technique takes both these viewpoints into consideration, by careful study of the facts, how profitable sales may be increased, and setting up standards whereby the cost of selling may be controlled. The breadth of sales activities is so great that it will be impossible here to cover all phases but attention will be given to, at least, the most important.

The Product

Many businesses are today trying to sell products that are relatively unsaleable. Within recent years, for instance, the gas industry found its sales of gas stoves dwindling rapidly because public taste had veered to the better appearance, the greater convenience, and the better performance of the electric range. No automobile manufacturer could hope to sell, in today's market, his product as it was three years ago. Even manufacturers of so-called staple fence lines find that consumer acceptance is shifting its ground in various ways.

The fact is, that, in today's market, "The Consumer is King." The day is past when a manufacturer could turn out a product according to his own ideas and force it on the consumer by insisting that it is just what is wanted. Today, more than ever before, it is vitally necessary to find out exactly what the consumer wants, and to give him just that.

The engineering technique meets this challenge with "Product Research." It discards all accepted ideas about the product and about its market, and sets out to learn the actual facts about these matters. Having the FACTS it is then in position to determine how sales can be stimulated.

(a) The market is thoroughly analysed to determine exactly what it wants in the way of a product. The consumer is ASKED what he wants, what price he wants to pay for it, how he wants it to be sold to him, in what manner and through what medium he wants it advertised to him. In short the consumer is made the real director of the sales function. To many businesses, "Product and Market Research" has meant the end of depression.

(b) The product itself is carefully analysed to determine how well it meets the requirements of the consumer. Can it be redesigned, or more attractively packaged to increase its sales appeal? The gas industry saved itself by discarding all preconceived ideas about

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gas stoves and by redesigning its product to meet the wishes of housewives. Hundreds of well known staple products have conquered the menace of new competition by more attractive and more convenient packaging of the product.

(c) The product is carefully analysed to determine uses for it hitherto unthought of. Consider cellophane. Originally a curiosity of limited use, it has been developed by careful research into a product of widely varied application.

(d) The product is analysed to determine whether it is properly made, or if it can be made more cheaply. Countless cases are on record where a simple redesign has so increased its sales appeal at the same time so reducing its cost of manufacture that a dying industry was given new life.

(e) Where there are many products, each of them is analysed to determine its relative profitableness. Experience indicates that many manufacturers have far too many lines, that the least profitable of these are commonly the easiest to sell and are, therefore, so sold by the sales division to the detriment of the profit and loss statement. In considering such items the effect of their volume on the absorption of overhead and similar costs must be thoroughly analysed, but it can be said, in general, that accurate knowledge of the relative profit on each product and the concentration of sales effort on the more profitable lines—even at the expense of sales volume—will commonly show a more adequate profit earned.

(f) The product line is analysed to determine if new products should be added to it to make it complete. The sale of a line of products is sometimes hampered by its lack of ability to fill all the demands made on it. This is commonly true where export business, or where the business secured through sales agents, forms a major part of the total trade. New products, also, sometimes make it possible to reach into desirable territory which could not previously be served with an incomplete line.

(g) The product is analysed to determine to what degree it is capable of absorbing the available manufacturing capacity, and what steps should be taken to absorb excess manufacturing capacity.

The Market for the Product

Relatively few companies really know the markets available to them. The sales executive is an exception who has the mental aptitude, the time, or the freedom from routine detail to examine the relationships between population, buying power, buying habits, standards of living, etc. and his product. Nevertheless a knowledge of these relationships is vital if full control over the sales function is to be secured.

Canada is such a far flung country, and its population and local habits so diverse, that full effectiveness of sales effort can only be

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made by adapting the effort to the habits of each major locality. A sales appeal that is effective in Ontario may fail completely in Quebec. A selling policy that fits the needs of Eastern Canada may be positively detrimental in the Prairie Provinces. An adequate knowledge of the potentialities of each market area is necessary for the complete measurement of the effectiveness of sales effort expended, and for the strengthening of sales effort in weak areas:

The engineering technique seeks to secure control:

- (a) By analysing the market to determine its logical subdivisions; to determine the concentration of demand and buying power in each area; to determine the buying habits and the reaction to various types of sales appeal in each area; and to determine the competitive position in each area. From analytical, and strictly factual, data so secured it is possible to determine the sales potentialities in each market area.
- (b) By analysing the market in the light of the foregoing FACTS, to determine the effectiveness of the present coverage of the market on the part of the sales division. It is common experience to find that a company is but "Scratching the Surface" of its potential market for want of accurate knowledge of the business available in the territory covered, or, on the other hand, that sales concentration in a particular territory is more intense than the business potentialities of the territory warrant. Not only does the rearrangement of sales effort, to increase the effectiveness of coverage, result in increased sales, but it also brings the cost of selling into more proper alignment with the business secured, thus cutting profit losses in the sales division.
- (c) By the analysis of the possibilities of export markets, which is a factor completely overlooked by many companies who are potentially able to serve export markets profitably.
- (d) By the scientific analysis of market potentialities, which will often disclose good markets that have hitherto not been exploited. Conversely, it will often disclose that certain markets are being exploited at a loss to the company and indicate the advisability of concentrating effort on the more profitable areas.

Sales Methods

Accurate knowledge of the product, and of the potential market for it, provides a basis on which to build sales methods that will be fully effective in the securing of business, yet subject to close control to the end that the business shall prove profitable. Far too often one business apes the sales methods of another without thorough consideration of the effectiveness of these methods under its own conditions, and the result is relatively poor. Though it is recognised throughout the business world that selling is its weakest element—that the sales methods of the average business are archaic in con-

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ception—relatively few business houses build their sales plan on a basis of logical, orderly, thought. Methods that are haphazard and based on intuition rather than on logic are the rule where they should be the exception, and profits are small in consequence.

Personnel

The quality of the personnel in a sales force is of vital moment. The selection of the salesman, his training, his equipment, and the co-operation given him by the house are factors of the greatest import, yet factors that are commonly given the most casual consideration. Here, as in all other managerial functions, the engineering technique seeks to set up definite standards against which to measure the effectiveness of procedure.

(a) The personnel of the sales division, from chief executive down to junior salesman, is analysed critically as to its individual faculties, capacities, qualities and powers. Definite bases of rating are set up against which it is possible to measure the profit earning effectiveness of each individual, and on which to judge the probable effectiveness of new employees. The costs of ineffective sales people, and of high personnel turnover in the sales division are terrific burdens borne by industry and not clearly realised by management. The elimination of these excess costs is not nearly as difficult as it appears to be.

(b) No sales person can be fully effective without training, but the great majority are allowed to get what training they can out of their experiences in the field without conscious direction from the house. The result is, at best, mediocre, and productive of results far short of those attainable through the thorough training of sales people. The art of selling is based on principles that operate as surely as the laws of nature, and which can be taught to the salesman in such manner as to greatly increase the effectiveness of his work. To sell goods effectively he must be thoroughly instructed in all the facts pertaining to these goods: how they are made, what material is in them, what they will do, how they compare with competitive goods, and a host of other pertinent points. Without such knowledge the salesman can not reasonably be expected to break down all the sales resistance he will invariably encounter.

It is not uncommon for a salesman to secure business by "selling" the institution for whom he works. To this end he should be fully instructed in the history of the house, its policies, its methods, and the service it is able to render.

Many sales are lost through the ineptness of the salesman in performing the technical details of writing up the particulars of the sale. For this there should be adopted a standard practise in which the salesman should be drilled until letter perfect. This is a "Service"

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detail, but one surprisingly effective in the avoidance of mistakes causing annoyance to the customer and unnecessary expense to the house.

(c) The salesman who is poorly equipped is at a disadvantage when his competitors are well equipped. The nature of the equipment necessarily varies of course, with the commodity sold, but at least it should, as far as possible, be adequate to permit the salesman to meet the requirements of his customer with a minimum of delay. The time commonly wasted by salesmen in securing from headquarters information that ought to be a part of their working equipment is enormous, and the unnecessary delay incurred is destructive of confidence on the part of the buyer.

(d) The degree of co-operation given by the house to the salesman is often a potent factor in successful selling. The man in the field is constantly encountering conditions that are out of the usual run of his experiences, requirements on the part of prospective buyers that are worthy of consideration but subject to the judgement of headquarters, new ideas, and the like. The house that is unsympathetic to communications from its salesmen relative to such matters is likely to find itself outstripped by its competitor whose co-operation with his salesmen is very close.

Every opportunity should be afforded by the house for the interchange of profitable ideas between its salesmen. A technique found unusually successful by one man may, if communicated to the others, be the means of increasing the success of all of them.

The house should co-operate fully with the salesman by seeing to it that all the functions performed by the house, but out of control of the salesman though having a bearing on his work, are promptly and efficiently performed. There is nothing more destructive to a salesman's enthusiastic effort than failure, on the part of the house, to render a perfect service.

Sales Policies

The house selling goods or commodities but with no clearly or definitely defined sales policy is like a ship without a rudder. Its sales effort has neither direction nor impetus. It is in a constant state of chaos, neither knowing where it is going, nor how to get there.

Without definite knowledge of the goal aimed at, and a clearly understood plan for the attainment of that end, it is impossible to plan the course of a business or to control the direction of its efforts. This is perhaps best illustrated by the case of the manufacturer who is willing to make anything and everything that is within his capacities. In nearly every such case the eventual result is, that what is intended to be a manufacturing business, rapidly deteriorates into a glorified job shop whose costs of production and administration are greatly in excess of the revenue that can be secured from miscellaneous work.

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The other outstanding example of a business operating without a definite sales policy is that one whose relations with its customers are as varied as is their number. With customer A one policy is in force, with customer B another, with customer C still another. Even in successive transactions with one customer the policy may vary. Inevitably this method is destructive of confidence on the part of buyers. It is productive of much dissension and uncertainty. It is costly to the seller and thoroughly unsatisfactory to the buyer. Unfortunately, it is all too common.

The engineering technique seeks to devise sales policies properly adapted to the needs and conditions of the business, and to so codify these policies that they will provide a definite guide for management in the profitable and permanently satisfactory conduct of the business.

Price Policies

The engineering technique seeks to base price policies on a factual rather than on the common theoretical basis. While it is true that the price is ultimately set by competition this does not necessarily mean that it is sound business for a manufacturer to set up his sales prices by referring to his competitor's price list.

As will be later explained in discussing production control one of the outstanding benefits of the engineering technique is its ability to set up predetermined costs for any product. In these costs there are three elements, a part that is fixed, regardless of volume of production, a part that is varied slightly by the volume of production, and a part that varies directly with the volume of production. The point, however, is that with any given volume of production, the costs of the product at that point are definitely known and a basis is thus provided for the determination of a price structure that will prove profitable under any given condition of business volume.

Then again, there are many businesses that are endeavouring to carry a price structure adequate to cover charges on productive equipment that is both obsolete and inactive and which could be written off, to the eventual profit of the business. This was one of the causes of abnormal depression in the automotive industry until recently.

The availability of factual data on these variables, under the engineering technique, makes possible the accurate determination of the profit-earning value of accepting large volume orders at prices lower than the standards. This is a control of the utmost value in times like the present when consumers are likely to dictate the price at which they are willing to buy. It is also of great value, because of its accuracy, in support of discussions with competitors in the endeavour to have them raise unduly low prices to a profitable level. For the same reason it is effective in determining accurately when the time has come to raise or to lower sale prices.

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Finally, the engineering technique, because it makes available all the facts, ensures the setting of the correct price for each product in a line. It is a most common experience to find most peculiar and absurd disparities between the prices of such items, and the resulting loss of securable business may be of great consequence.

In service businesses where the sale price is based on an estimating-and-bidding procedure the availability of accurately predetermined production and selling costs not only facilitates the work of estimating but it also ensures the quoting of an absolutely correct price in every bid. Anyone who has had any experience with businesses of this nature knows that the average bid under ordinary methods of procedure is but little better than an educated guess. The wide variation of prices quoted on construction and engineering work is ample evidence of this, and it can not be accounted for solely on a basis of the productive efficiency of the bidders.

Control of Sales Expense

Salesmen's Remuneration. The payment of salesmen on a "Salary and expenses" basis is a common practise. Its weaknesses are, that the only available measure of the salesmen's effectiveness is a comparison of his productivity with that of other salesmen, that there is no direct relationship between his remuneration and his profit-earning value to the business; and that his basis of remuneration does not provide him with any direct incentive to voluntarily increase his sales efforts or to control his expenses.

The payment on a "Commission" basis is better in that, at least, it provides an incentive to the salesman to exert a maximum of sales effort and so secure high earnings. It is weak, however, in that the basis of commission paid seldom bears any direct relationship to the relative profitableness of the goods sold, nor does it direct the effort of the salesman into channels yielding the maximum of profit to the business.

A more scientific basis provides for the payment of salesmen's remuneration in two parts. The first part of his earnings is designed to cover his cost of securing business and is based on the monthly payment to him of an accurately predetermined sum for each active customer he has on the books. The accurate determination of this sum is a matter of careful research.

The second part of the salesman's remuneration consists in the payment to him of a commission or dividend on each sale, based directly on the profitableness of the sale.

Under this plan the first part of the payment specifically directs to the attention of the salesman the necessity of giving complete coverage in his territory and ensures the thorough cultivation of every source of potential business. At the same time it impels him to exercise strict control over his selling expense. The second part

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provides an incentive to the salesman not only to secure a maximum volume of sales, but also to give due attention in his selling to the relative profitableness of each item in his line.

The control secured by this plan is complete in that selling expense is predetermined and standardized, and any unusual deviation from the standard comes instantly to the attention of management and is thus susceptible to close control. The further point that the attention of the sales division is concentrated on the securing of profit, rather than on the mere securing of sales volume for its own sake, is of inestimable value. Countless cases are on record of firms securing the largest sales volume in their history yet earning no profit because the great bulk of the sales volume was in "no-profit" lines. This accounts for much of the "Profitless Prosperity" of 1928-29.

Distribution Expenses

Sales organizations tend to "Just grow, like Topsy," without conscious planning or direction. As a result there are many that are top heavy and full of functions that are either completely unnecessary or relatively ineffective. A case in point is that of a large merchandising company that had distributing warehouses scattered all over the country, each completely equipped with bookkeeping, credit, and billing departments, and the whole entailing tremendous expense. A simple change in distribution methods actually made it possible to render better service to the company's customers, yet permitted the number of distributing points to be greatly reduced, the clerical functions to be centralised, and something like \$600,000 per annum saved in the cost of distribution. Incidentally a co-incident change in billing methods resulted in the more prompt payment of accounts to such a degree that the interest paid to banks for working capital was substantially reduced.

Sales Budgeting

The sales budget, properly developed and properly used, provides the ultimate in control. Since, however, the sales division is so intimately dependent upon the activities of other divisions, and since the engineering technique provides for budgeting for the whole business, full discussion of budgetary control will be made at the end of this paper.

Production Control

Countless businesses able to sell in adequate volume and at an adequate price are yet unable to show adequate profits because their potential profits have been frittered away in the production division for lack of adequate control. The wastage is not deliberate, it occurs because management does not realise that it exists. The engineering technique, through research, standardisation, and control, brings all wastage to light and provides for its effective elimination.

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Labour Control Technique

Wages, in most industries, constitute the largest controllable item in production cost. With proper technique of wage payment enormous savings in production cost are possible of accomplishment. It must, however, be kept in mind that wages constitute purchasing power and that a depressed level of earnings by labour inevitably means depressed purchasing power in the community, with a resulting restriction of markets. It is, therefore, of vital importance to pay labour the highest wages possible and to secure profit by seeing to it that the productivity of labor is proportionately high so that unit costs shall be low. Only the most effective control can make such a result possible.

There are a great many schemes and devices for the payment of wages. Broadly classified these fall into three major groups.

1. **Day rate plans.** In this group the worker is paid a fixed rate of wages per hour, per day, per week, or per month. The payment is made solely for the time worked. It bears no direct relation whatever to the amount of work done in that time, and there is no basis for measurement of its effectiveness except the opinion of the foreman as to whether or not the worker is a good one. This plan is the direct negation of control and nothing more need be said about it.

2. **Piece-work Plans.** In this group the worker is paid a definite sum of money for each unit of finished work done, regardless of the time taken to do it. The unit cost of labor in the product is thus fixed, which, at first sight, would appear to be a desirable control. The plan however is weak in many respects.

The primary weakness lies in the method of setting the piece-work rate to be paid. Too often this is done on a thoroughly unscientific basis. One method is to go back in the records and determine the volume of production secured in a given period of time and the labor cost of that production, then to divide the labor cost by the volume so getting an average unit labor cost, which price—or some lower figure—is then set as the piece rate. Another method is to select a good worker and determine the unit cost of his or her production, which cost is then set as the standard rate to be paid. There are many variations of the method but, in general, the piece rates are usually set on a basis of past performance or on sheer estimates.

Now it is a fact in human nature that relatively few people will do any particular operation in exactly the same way. One will do it in a better way than another and will save time and economise effort in the doing of it. It is obvious, therefore, that there must be one best way of doing anything and that that will be more economical in time and energy expended than any other. The piece rate plan,

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when its rates are based on estimates or on past performances, takes no notice of this fact with the result that when a piece rate plan is first introduced into a plant where day rates have been in force, the employees immediately begin to study better and quicker ways of doing the work, so that they may increase production and secure larger earnings. From the owner's point of view this is all to the good for his overhead cost does not greatly increase and since this burden is spread over a larger volume of production, he finds his unit overhead cost reduced. But the matter seldom ends there, for the manufacturer soon finds his employees earning wages that are abnormally high, and realises that during the time he was paying day rates his employees were not giving him all that they could have given. Then again, the high earnings of his employees soon attract other workers anxious to get in on a good thing and these competitors in the labor field will offer to accept piece rates slightly lower than those prevailing. Eventually the manufacturer cuts the rates to lower figures—and he immediately has labor troubles on his hands. Even though his employees do not strike they will very soon come to realize that there is a point in their volume of output beyond which it does not pay them to go for fear of having the rates cut again, so they tend to restrict their pace to that output and no more, even going to the length of intimidating ambitious workers who desire to work at maximum efficiency. The eventual result, from the owner's standpoint, is that while the piece rate plan gives him better control than the day rate plan and lowers his unit labor and overhead costs in some degree, he still fails to get from labor all the production of which labor is capable without undue effort. His costs, therefore, remain relatively higher than they could be if labor could be induced to co-operate to the full.

The foregoing is by no means a thorough analysis of the operating weakness of piece-rate plans, but it is probably sufficient to indicate their general effect.

(3) **Controlled Incentive Plans.** These plans form the third broad group, and they are the ones used by the engineering technique. In their application there are many variants, but all of them are based on the same general principles, and they provide the ultimate in positive control of labor costs

All possess three similar characteristics:

- (a) The guarantee to the worker of a standard **measured** time allowance for each operation he is required to perform. This time allowance is determined by the management in a most scientific manner and has embodied in it the "One best way" of performing the operation. All waste effort is eliminated. Once established, the management guarantees that the time allowance will not be altered, except when a new and better method of performing the

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operation is put into use, in which case a new time allowance will be determined and similarly guaranteed against change.

- (b) A guaranteed hourly rate to each worker, regardless of his production. This rate may be varied from time to time with changes in price levels, business conditions, etc. or in special recognition of length of service, increased responsibility, etc., but the basic principle is that the worker is guaranteed a minimum rate of earnings (at the then prevailing price level) for each hour worked.
- (c) A premium, or bonus, paid to the worker for production in excess of the standard, i.e. for production in less than the guaranteed time allowance.

The setting up, by the management, of a guaranteed, measured time allowance for each operation is the crux of the plan. It is here that labor wastage is eliminated, that substantial economies are effected, and that positive control is established. It involves the careful study of each production operation by men trained in scientific analysis, the breaking down of the operation into its elements and the careful and accurate measurement of the time required by each element, the elimination of all elements that are unnecessary or ineffective, and the recombining of the selected elements into the synthesis of the "One best way" of performing the operation. Thus a standardised method of operation is set up in so scientific a manner that management is assured of every operation being performed in the most economical and effective way consistent with the productive equipment available, and the time allowance necessary for the performance of the operation in the standard way is accurately measured so that there can be no possible doubt as to its correctness.

The time allowance is so set that it represents the time in which the average worker, operating at his average speed, exercising average skill, and exerting average effort can turn out his work comfortably within the time allowance. The worker, however, who by reason of superior skill, or increased effort is capable of doing much more than the average work has every incentive to do so since he is paid a handsome premium or bonus for the time he saves over that allowed, and, because of the guaranty feature in this plan, he will have no fear of so doing.

The controlled incentive technique of wage payment is superior to the piece-rate plan in that its basis of rate-setting is demonstrably accurate. If a worker claims that the time allowance for an operation is too low the time study record can be shown to him and the correctness of the time allowance proved. Management, on the other hand, is relieved of the fear that incentive rates will prove to have been incorrectly set when put into practice and has the further assurance that the rates set provide for the most efficient operation of which his equipment is capable.

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The use of the controlled incentive technique of wage payment has been productive of extraordinary savings in direct labor productive cost, while at the same time raising the level of wages. Some idea of the magnitude of these savings may be gained from a study of the following table.

SAVINGS GAINED THROUGH THE APPLICATION OF CONTROLLED INCENTIVE TECHNIQUES

Type of business	No. of Employees	Payroll	Annual Savings	Cost of Securing Savings
Greenhouses	43	\$ 63,750	\$ 9,250	\$ 1,480
Wax Paper etc.	55	181,680	20,000	3,310
Shoes	60	105,841	17,350	2,743
Heavy Hardware	85	93,364	19,396	7,904
Refractories	94	145,049	32,780	4,110
Job Foundry	100	110,114	30,831	4,781
Tires	106	99,399	13,500	4,140
Confectionary	131	121,874	31,687	6,553
Machine Tools	187	489,000	108,000	14,600
Paper Boxes	203	234,948	39,500	6,980
Paper Products	298	488,494	73,000	14,600
Valves	374	406,925	128,043	19,552
Refrigerators etc. ...	402	478,000	68,300	14,900
Cocoa & Chocolates ..	421	715,217	41,200	19,341
Steel	420	601,005	180,000	23,740

The economies effected by the controlled incentive technique are not by any means confined to savings in direct labor. The standardization of operating methods by competent research opens up a whole new field for further economies. A costly machine, for instance, may have an hourly overhead cost several times that of its operators wages, and may have been operated under a less scientific wage plan at a relatively low rate of production. After the operation has been analysed, however, and the one best way of performing the operation has been determined, the machine will be operated at its maximum capacity and the unit overhead cost of the product will be greatly lowered. This is a clear saving to management.

Obviously this technique makes possible the fitting of operators to their work, and the elimination of "Square pegs from round holes." In departments where machine speed controls the rate of flow it makes possible the maintenance of the maximum economic speed. In departments where operator speed controls the rate of process flow, it invariably greatly increases the rate of flow. Because it greatly increases machine-operator capacity it often eliminates or postpones

MANAGERIAL CONTROL

the need of capital expenditures for extra productive machinery in heavily loaded departments.

The definite control of any desired quality of workmanship is a feature of this technique. This factor since it is taken into consideration in the setting of the standards, can be made one of the elements in the premium or bonus paid.

The determination and standardization of time allowances for the elements entering into productive operations makes it possible to accurately pre-determine what the productive labor cost will be on products that have not previously been made. This is of particularly great value in businesses making a wide diversity of non-standard products, or whose selling is done on the basis of an estimating—and—bidding procedure.

Finally, and of great importance, the principle of direct reward for measured performance can be profitably extended to the control of indirect labor costs and of manufacturing expense. Standards for those items are scientifically set and foremen and other sub-executives controlling these expenditures are paid premiums for bettering the standard performance.

Production Flow Control

Untold profits are lost to industry through lack of careful planning of the flow of work through productive operations. It is a fact, in many industries that as much as 80% of the energy expended is absorbed in the handling and transport of work between productive operation, much of this non-productive work being sheer waste. The elimination of waste effort between productive operations through careful attention to the layout of productive machinery, the arrangement of operations in their proper sequences, the routing and scheduling in advance of the flow of production, and the provision of mechanical aids for handling and transporting work is a field in which the engineering technique is able to realise substantial profits hitherto lost.

If its engineers and conductors were permitted to exercise their own initiative in the running of trains the result, in a railroad system, would very quickly be a condition of chaos, but a very simple technique of routing and scheduling in the train dispatchers office renders this condition down to one of the utmost order and precision. A factory presents a control problem exactly similar to a railroad in that its flow of productive work in various directions is subject to costly collisions, delays, congestion, and unbalance. The engineering technic provides for its orderly control in a manner precisely similar to that of a railroad.

Inventory Control

Money tied up in an overlarge or unbalanced inventory is unproductive and subject to loss. Physical depreciation, obsolescence, price

COST AND MANAGEMENT

fluctuations, rent of space etc. take their toll of such an inventory to the detriment of the profit and loss statement. Inadequate inventories, on the other hand, cause costly delays in production, often require the expenditure of excessive sums of "Rush" production, and are a common cause of lost sales because of inability to render the service required by the buyer.

Few businesses today operate without some form of inventory record, and many keep the record constantly up to date with some form of perpetual inventory. In many cases, however, the record is simply one of issuances and receipts with a "balance" column showing the quantity currently in stock. No attempt is made to maintain a scientific balance between the inventory and the flow of orders drawing from it, with the common result that the inventory at one period is in excess of demand, and at another inadequate. If the perpetual inventory principle be extended to allow for the debiting against stock on hand of the drafts against that stock that will be required for production of orders, and if this debit is made immediately on receipt of the order regardless of the time in the future when the material will actually be withdrawn from stock, the danger of the inventory proving inadequate at the point of peak production is largely obviated. Conversely this practice, since it provides the complete and accurate picture of inventory position obviates the need of carrying an excessive stock in order to be prepared to handle orders that may not actually appear.

This is an engineering technique that is well known but it is regrettable that many of the medium sized and smaller companies have not yet adopted its principle. Had it been in common use in the early days of the recent crisis much of the forced and sacrificial liquidation of excessive inventories would not have been necessary.

A feature of this strict control of inventory is its ability to indicate to management quickly enough to be effective any losses occurring by pilferage and wastage. It is also effective in bringing to the attention of management any lines that are slow moving or in danger of becoming obsolete, thus affording opportunity to have the sales department exert special effort to move them.

In recent years certain companies and notably those manufacturing standard lines have so developed the engineering technique as to be able to eliminate inventories completely. In these cases the co-ordination between material requirements and production schedules is so complete that material for each day's needs arrives at the plant daily and is processed and shipped the same day. This is an ultimate in inventory control not applicable to many businesses, yet applicable to many more than are now using it.

MANAGERIAL CONTROL

Waste Control

Waste is rife in industry. Wastes of material, of labor, of heat, of time, and of money. Some of them are relatively minor in character, some of major importance. In the aggregate they rob the business of an important and substantial portion of the profits it could earn.

Such wastes are too many and too diversified in character to discuss here. They exist, usually, because management is not aware of their existence, is not aware that they are wasteful, is too apathetic to do anything to remedy them, or lacks the time or the personnel to investigate them. The engineering technique in the course, of its research work, invariably brings all such wastes to light and indicates the economical remedy for them. An outstanding characteristic of all industry is its toleration of wasteful practices that have become a habit. Things are done in certain ways because they have always been done that way, or because such is the accepted trade practice, and management, being so close to things and so habitually used to seeing them in familiar forms, seldom stops to wonder if they could be done in better ways. It is for this reason that the engineering mind, with its fresh and unbiased viewpoint and its highly developed analytical ability, can be and is of such great help to industry in the securing of more adequate profits through the elimination of waste.

Financial Control

The financial experiences of recent years are in themselves sufficient evidence of a need for better and more intelligent control of financial policies. Methods of providing for the fixed and working capital requirements of a business that are so easily upset as have been those of recent years obviously leave much to be desired.

This subject is altogether too broad for detailed discussion here, but it is one so intimately bound up with the other divisions of business that it may be well to point out how the engineering technique is able to simplify, and to assist in placing on a more sound basis, the work of the treasurer.

The engineering technique deals only with facts. It rules out, as a basis for managerial judgment, all rules-of-thumb, guesswork, opinion, hearsay, and all other than strictly accurate concepts. It provides a practical means for the accurate determination of facts. for their presentation in an organized manner, for their use in the accurate forecasting of future conditions, and for their use as standards against which to measure all deviations from ideal conditions.

Invariably where such technique is in use its benefits eventually extend into the treasurer's department. Far more quickly than by any other method, far more accurately and in more comparably form, he finds himself possessed of a complete picture of every detail of the firm's financial requirements. The daily financial position, current

COST AND MANAGEMENT

and future needs for working capital, new commitments and resources, unusual or special deviations from normal conditions, the basis of prices and changes in price levels, all of these are brought before him almost automatically and without the frantic rush and excitement commonly incurred when special information is needed. Consequently he is enabled to form his judgments on financial matters with the utmost assurance that the basis of his judgment is correctly based on facts and that all the facts are in the picture. Similarly, where questions of fixed capital are under consideration sound judgments are easier to form because of the availability of reliable, factual data not only on the tangible values that can be determined by ordinary accounting, but also on the intangibles that are commonly so difficult to evaluate. In the consideration of new security issues, and in the negotiation of their sale by underwriters, the possession of such data is of inestimable value.

It is probable in the future that the capital structures of companies will be built on more rational grounds than they have been in the past. Already, competent observers and analysts, are beginning to show that there are definite ratios between the various financial elements, that represent sound financing for any particular industry and they are proving that ratios other than these represent unsound and dangerous practice. The basis of determination of these ratios is a thoroughly scientific one and it is probable, in the relatively near future, that they will form effective standards against which to measure the effectiveness of the financing in any one company. This is a fruitful field for technical investigation as yet given but little attention by management.

Cost Control

Cost accounting is a relatively new science, and one developed more by engineers than by accountants. At first cost accounts were set-up for the purpose of demonstrating what the cost of the product had been. As history they were useful in some degree, assuming their accurate compilation, in showing whether or not a particular product was paying a profit, in determining the price at which a particular product could profitably be sold, in providing a basis for estimating on new work, and in comparing the effectiveness of one month's work with that of another month.

As cost controls, however, this procedure is practically useless inasmuch that cost reports reach the executive's desk long after the work is done and if any losses have been incurred it is too late to do anything to recover them or even to prevent their recurrence. Nor, since they are but statistical reports on what actually had been done at some time in the past, can they in any practically useful way indicate the degree of efficiency of operation.

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The engineering technique, with its ability to forecast in advance the cost of manufacture on a standard basis, made possible the setting up of standard costs in which the object is to show—in a manner that cannot escape attention—any place where costs are deviating from the pre-determined standard. Since the technique is such that each day's costs can be determined and compared with the standard **the same day they are incurred**, and since they are so set up that all losses are immediately and inescapably apparent the opportunity is afforded management of stopping or correcting losses before they reach any great magnitude. The standard cost technique thus provides a maximum degree of daily cost control, in addition to furnishing all the statistical information, required for other purposes.

Administrative Control

The functions of the administrative division are many and varied and so highly complex that they always tend to be very expensive in their execution. Management, naturally, desires these functions to be performed as systematically and efficiently as possible. Unfortunately, the common tendency is to depend upon "System" as such, to keep order, with the result that system is piled upon system without any proper co-ordination between the various functions until the whole becomes top-heavy and enormously expensive. Much of the so-called "System" is a curse rather than a blessing.

Here, as in the financial division, the engineering technique tends to bring about simplification of functions. The basing of much of the operating data on facts secured by research sets up once and for all much of the information that other techniques have to determine and redetermine every time it is needed. The organizing of this data in a logical technique of control automatically removes from the administrative division much of the repetitive detail with which it formerly had to contend and so eliminates the need for much of the "System" that is expensive.

Similarly the organization of the personnel and functions of the administrative division along the same sort of scientific lines as are applied to production division, eliminates waste effort, speeds up the output of useful work, provides a degree of control hitherto unthought of, and greatly reduces the costs of administration.

Budgetary Control

Financial stringency in depression years has forced practically all businesses to adopt some form of budgeting procedure. These budgets range all the way from simple guesses at the probable sales and probable costs of doing business, to every elaborate budget; which are scientifically set up and revised periodically with changes in conditions. Regardless of their simplicity or complexity there can be no doubt that the adoption of budgets in the attempt to keep expenditures under close control is of great benefit to business, and there

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can be no doubt that with growing experience the quality and usefulness of budgets will be improved.

In this, however, as in all other phases of business control there are widely divergent viewpoints as to the method of budgeting. A common viewpoint is that the probable volume of sales should be the starting point, that all the costs of servicing these sales should be estimated and deducted from sales revenue, the remainder representing profit earned.

The engineering technique follows a different viewpoint. It considers the earning of an adequate profit as being of vital importance to the success and progress of the company, budgets with this profit as its starting point, and directs its executive attention to the fulfilling of the conditions necessary for the earning of this profit. Under this plan the budget becomes not only a guide and control but also sets up an ideal mark at which to aim. Invariably this results in a more intelligent and better directed expenditure of effort in the business.

Application of Engineering Technique

The foregoing is by no means an exhaustive treatment of the subject, but is rather an outline of some major points of interest. The reader may say that the whole thing is but fundamental common sense and may be impelled to ask what need there is for the employment of outside engineers in its application. The answer lies in this that no ordinary industrial management has the time available or the freedom from routine detail to enable it to exhaust all the possibilities for cost saving and sales improvement in a sufficiently short time to justify the expense involved. Nor, usually, is the executive so familiar with the ultimate effect of various courses of action as is the trained industrial engineer who has had wide experience of successful practices in a broad field of business.

The employment of competent industrial engineers to advise on and direct the application of engineering techniques to business, ensures that the application will be made in a completely co-ordinated manner, without the disruption of ordinary routine encountered when inexperienced experimentation is indulged in, and at a rate of speed adequate to ensure quickly profitable results.

Willie—"Please, teacher, what did I learn today?"

Teacher—"What a peculiar question!"

"Well, they'll ask me when I get home."

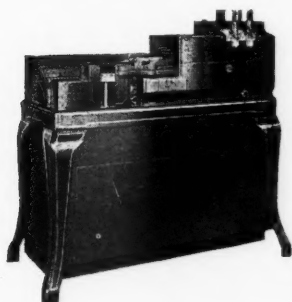
* * * * *

"What has become of your ethics," reprimanded the old doctor to a student.

"Why, didn't you know I traded it for a Hudson?"

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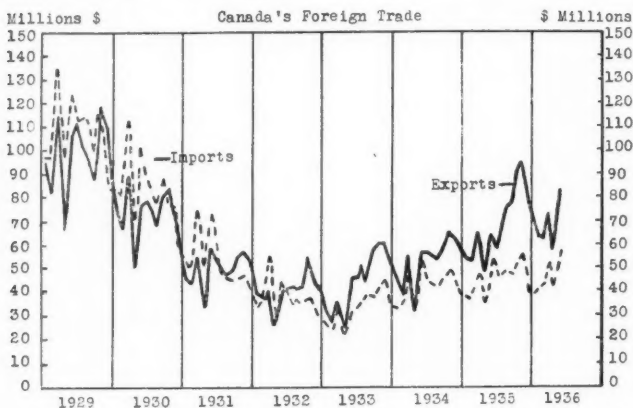
FOREIGN TRADE SHOWS RAPID RECOVERY

Volume Has Doubled Since April of 1933—Exports Taking the Lead,
Since New Purchasing Power in Foreign Markets Must Come
From This Source—Large "Favorable" Balance Results

By W. A. McKAGUE

A SHARP rise in foreign trade, with exports stepping well ahead of imports, has been one of the most important features of business recovery in Canada. Our foreign credit having been already stretched to the limit, it was necessary for our exports to move up to give us the wherewithal for buying abroad. But during the past three years, imports have been maintained at well above the lowest depression levels, and they still show a tendency to gain.

The extent of the change is illustrated by comparing April with the same month three years ago. April, 1933, was the very lowest point of the depression so far as Canada's foreign trade is concerned. Imports in that month were \$20,457,294, and exports were \$20,011,652. In April, 1936, however, imports were \$42,223,185, representing a gain of over 100 per cent, while exports had increased by nearly 200 per cent to \$57,423,830.



Exports have climbed most of the way back to their previous high levels, though imports are still at only about half their 1929 rate. To a large extent imports into Canada are dependent upon

FOREIGN TRADE SHOWS RAPID RECOVERY

industrial activity. That is, they consist of steel for building, machines for manufacturing, partly finished textiles, etc.; only a part go direct to consumers. As a matter of long term comparison, imports have followed closely the trend of domestic industry.

In the fiscal year ended March, 1936, there was an export volume of over \$765 millions, compared with \$660 millions in the previous year. Every main class of exports except the iron and steel group and the chemicals showed important gains. This meant new purchasing power for the farmer, the miner and the manufacturer, to a total of over \$100 millions for the country as a whole. In the same year, imports increased from \$552 millions to \$563 millions. This rise also was distributed over most industrial groups.

It should not be concluded, however, that the excess of exports over imports in recent years has created a large accumulation of cash or credit abroad. Apart from commodities, there are "invisible" items of debit and credit, the largest of which comprises the remittances made or due each year on investments of foreign capital in Canada. These investments include some of our government and municipal bonds, mortgages on properties, and securities of Canadian corporations, and a further very important group consists of branch plants of American concerns, from which earnings are normally drawn. It is estimated that investments of British and foreign capital in Canada total well over \$4,000 millions, which at an average earning power of say five per cent would normally require a surplus of about \$200 a year in commodity exports over imports. That was almost exactly the situation in the year ended March, 1936. In other words, in that year we may be considered as having held our own in international business.

The benefits of improved foreign markets have been felt in respect to wheat and other farm products, lumber and paper, minerals, and a considerable proportion of manufactures. Mainly the increases have been in volume rather than in prices. The change therefore has its effects on our whole transportation system, including ocean and fresh water shipping, the railways, and the vast trucking system which is a part of modern freight handling.

In April, exports showed a gain of \$10 millions, and imports a gain of less than \$6 millions, over April of last year. In May the rise in exports was about \$18 millions, and that in imports about \$5 millions.

It is not likely that exports will remain higher than imports indefinitely; that is, we will not set out to repay the foreign investment in Canada all at once. Unless Canada becomes a back number economically, it should continue to interest foreign investors, and when the stage is reached that fresh credits are granted on this account, business should expand more rapidly, and bring with it increased imports of goods.

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REFERENCE LITERATURE

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EXAMINATION RESULTS

At the Society's examinations held in April and May, 1936, twenty-six candidates sat for first year Cost Accounting, six tried for second year Cost Accounting, and two tried second year Business Organization and Administration. The following are the names and marks of those successful:

First Examination Cost Accounting

Boland, T., 84; Dullege, F. F., 80; Dubin, D. S., 77; Oxley, Norman, 76; Deschatelets, George, 75; Bernier, C. W., 74; Paynter, F. W., 73; Scott, E. S., 73; de Bruin, T. G., 69; Naylor, F.W., 62; Belle Isle, J. C., 61; Campbell, F. M., 61; Hutchison, W. A., 60.

Second Examination Cost Accounting

Mackie, John, 91; Adamson, A. S. 81; Hinde, Frank L., 73; Paynter, F. W., 70; DeVolpi, D., 67; Belle Isle, J. C., 61.

Second Year Business Organization and Administration

Adamson, A. S., 100.

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Industrial Procurement

Harvard Business School is conducting this month, July 1 to 31, a special session for business executives, under the general head of "Industrial Procurement," with Howard T. Lewis, and Edmund P. Learned, professor and associate professor of marketing, respectively, as instructors. The following gives a detailed outline, indicating some of the important business problems of current study, which include the relation of costs to buying policy and production.

Both the purchasing and sales management functions of business enterprises have their common background in the contacts of sellers and buyers. One-half of each day's instruction is designed, therefore, to furnish a broad marketing basis for the study of purchasing.

The section on marketing first considers briefly certain problems relating to the effects of the consumer's buying habits and motives on retail policies, followed by a discussion of wholesaling of consumer's goods, particularly as affected by recent trends in retail distribution. The primary emphasis in this section of the course is, however, laid upon problems relating to the marketing of industrial goods, such as types of markets, channels of distribution, sales promotion, and some fundamentals of price policy.

The procurement section has as its objective an analysis of industrial procurement as a major function of business and as an integral part of sound business policy. Consideration is first given to the nature and scope of the function, problems of organization as operative in different types of companies, and the relationship between industrial purchasing and the other major functions of business. Discussion then centres around the issues involved in the determination of the proper type, quality, and quantity of materials and equipment required and in the selection of sources of supply. Attention is next devoted to price policies and speculative purchasing, the place and use of procurement budgets, and the various attempts to measure the efficiency with which the purchasing function is performed. The course concludes with a group of problems dealing with general company policies as affected by probable future developments of the purchasing function.

Marketing Section

I. Introductory

1. General scope of the marketing field; the relation of marketing to the other fields of business activity; the interrelation of the commonly considered subdivisions of the field of marketing. Special attention will be devoted in this preliminary section to the broad interrelations between production, mer-

INDUSTRIAL PROCUREMENT

chandising, sales management, and sales promotion and advertising.

2. User influence: A discussion of the basic influence of the user of merchandise on questions of marketing policy. Such questions will be considered as the influence of buying motives and buying habits upon the patronage appeal of institutions.
3. Analysis of cost of marketing and the problem of expense control. The purpose at this point is to clarify the use of terms commonly used in connection with cost, and to consider the proper place, and the limitations of cost analysis as a foundation for determining marketing policy, rather than to raise the more detailed questions of cost and expense control.

II. Types of Retail Enterprise

1. Classes of merchandise in relation to buying habits and buying motives; selection and control of merchandise; questions of clientele; selected problems in store organization; inter-outlet competition; trends in retail distribution.

III. Types of Wholesale Enterprise

1. Function of wholesalers in modern distribution with particular reference to selected types of merchandise; trends in

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COST AND MANAGEMENT

wholesaling; new types of wholesalers; cooperative buying groups; voluntary chains. Some specific problems in wholesaling, such as those arising from the stress on volume; problem of the small order; of drop shipments. Stressing of wide margin merchandise. Cooperation with manufacturers; with retailers.

IV. Channels of Distribution

1. Selections of Retail Outlets for Consumers' Goods and Types of Middlemen for Industrial Goods.
2. Determination of Number of Outlets of Type Selected.
3. Selection of Wholesale Middlemen for Consumers' Goods.
4. Direct Sale.
5. Trade Discounts.
6. Selling Agents, Brokers, and Manufacturers' Agents.

It is proposed to give greater emphasis in this section to industrial goods than to consumers' goods. Industrial goods will be recognized as including broadly installations, accessory equipment, operating supplies, fabricating parts, and primary materials. The importance of recognizing, in marketing policy, the distinction between this class of goods and consumers' goods, and between the various types of industrial goods themselves will be stressed.

V. Selling Policies, with particular reference to brand policy, and sales promotion and advertising policy.

1. Trade-Marks.
2. Distributors' Brands versus Manufacturers' Brands.
3. Blanket Brands.
4. Branded Parts and Materials.
5. Advertising.

Cases on advertising and promotion will be based chiefly, but not wholly, on industrial goods. Topics to be considered will be such as:

Coordination of advertising with other promotional methods.

Use of surveys made preparatory to entering upon an advertising campaign.

Cooperative advertising.

Promoting a new product.

Determination of the advertising budget.

Industrial catalogues.

Designing service.

VI. Price Determination and Price Policies.

1. Relation of Supply, Demand, and Cost to Price.
2. Pricing a by-product.
3. Overhead Costs and Price.
4. Quantity Prices and Deferred Discounts.
5. Uniform versus Varying Price Policy.

INDUSTRIAL PROCUREMENT

6. Single and multi-price Policy: Trade-in allowances, free deals, and other price concessions.
 7. Resale Price Maintenance.
- VII. Marketing Policy.
1. Consideration of some broad problems of Company policy, with particular emphasis on the interrelation of production, marketing and finance. The discussion will be centered on a very limited number of rather exhaustive cases, designed to emphasize the place of a careful diagnostic treatment of the larger company problems, and of a full recognition of the interdependence of the major function of business in determining sound policy.

Industrial Procurement Section

This section has as its objective an analysis of industrial procurement as a major function of business and as an integral part of sound business policy. The course will be conducted as a series of class discussions based on Lewis. H. T., **Problems in Industrial Purchasing**, supplemented by **Industrial Purchasing**, Pamphlets of the National Association of Purchasing Agents, and other source material. The following outline presents some of the topics which will be discussed:

I. Introduction

Significance of procurement in the determination of general company policy.

II. Nature and Scope of the Function

1. Definition of purchasing—what is its proper scope.
2. Relation of purchasing to production, inspection, traffic, merchandising, selling, advertising, law, finance, research.
3. Actual types of organization.
4. Proper organization as affected by size of company, nature of the business, number and location of plants, etc.
5. Problem of centralization and decentralization.
6. Purchasing for employees.

III. Purchasing Procedure

1. Importance of procedure.
2. Steps in procedure: Determination of nature and urgency of need; Accurate statement of the character and amount of the article or commodity desired; Transmission of the purchase requisition; Negotiation for the possible sources of supply; Analysis of the proposals, selection of the vendor, and placing of the order; Checking of the invoice; Receipt and inspection of the goods; and Completion of the record.
3. Purchase forms.
4. Purchase records and reports.
5. Problem of small orders.

COST AND MANAGEMENT

IV. Quality

1. Importance of quality.
2. What is "best quality"—relation to service and price.
3. Immediate and ultimate responsibility for determination of proper quality.
4. Responsibility of purchasing officer in determination of quality.
5. Responsibility of purchasing officer in the purchase of major equipment.
6. Problems in purchase of major equipment.
7. Purchase by description—brand, grade, sample.
8. Purchase by specification: When desirable; Essentials of proper specifications; Sources of information as to standard specifications.
9. Inspection and testing, Types and Adequacy of; Responsibility for.
10. Handling of rejected material.

V. Quantity

1. Relation of purchasing to inventory control; Types of inventory control.
2. Coordinating purchases with production and sales.
3. Determination of "most economical" quantity to buy.
4. Control of stores: Responsibility for; Classification; Pricing; Issue.
5. Disposition of salvage: Scrap; Waste; Excess material.

VI. Sources and Assurance of Supply.

1. Information as to sources.
2. Treatment of salesmen.
3. Handling of samples
4. Some factors entering into buyer-vendor relations:
 - a. Loyalty to vendors.
 - b. Support of local sources.
 - c. Reciprocity.
 - d. Bribery.
 - e. Middlemen as sources.
 - f. Supervision over suppliers' manufacturing operations.
5. Manufacture versus Purchase.

VII. Price Policies

1. Factors that control price.
2. Use of forecasting systems and services.
3. Determination of what constitutes a "fair price".
4. When is price bargaining justifiable.
5. Handling of bids.

